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ABSTRACT

This lesson plan is intended for use in conducting classes on plant identification. Presented first are a series of questions and answers designed to convey general information about the scientific classification of plants. The following topics are among those discussed: main types of plants; categories of vascular plants; gymnosperms and angiosperms; dicots; monocots; plant families; and classification of plants by their parts (leaves, stems, flowers, seeds, and roots), life cycle, and/or hardiness. Also provided are the following: a glossary of pertinent scientific terms, four worksheets, answers to the worksheets, a quiz and quiz answers, six overhead transparency masters, and a lesson plan for teaching students to identify 10 plants. Included in the lesson plan are an objective, list of equipment needed, detailed steps for completing the activity, and student activity record sheet. (MN)

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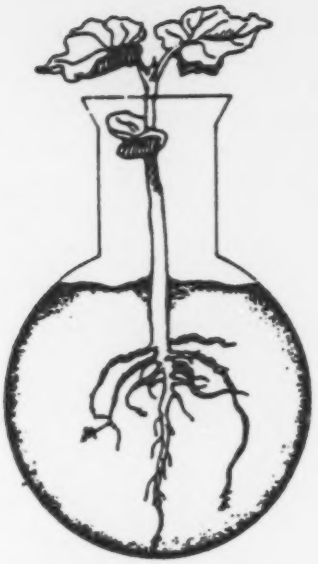

Agricultural Lesson Plans

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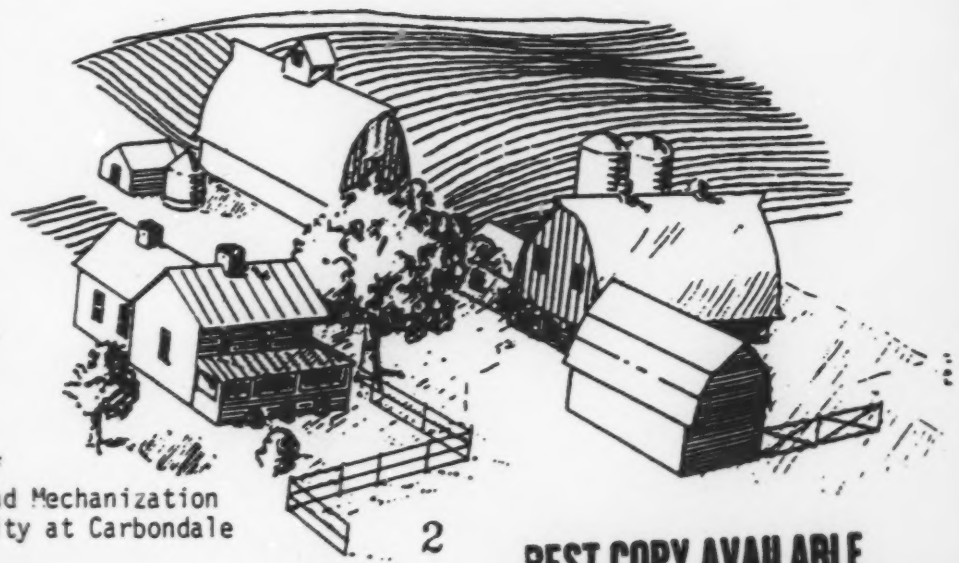

CE 065-309

Department of
Agricultural Education and Mechanization
Southern Illinois University at Carbondale

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The Scientific Classification of Plants

1. What are the two main types of plants ?
   - The plant kingdom includes organisms that contain chlorophyll. There are two main types of plants, plants with vascular systems and plants without vascular systems. All vascular plants have true roots, stems, and leaves. Vascular plants have tissues made of tubelike cells that carry food and water throughout the plant. These tissues are called xylem and phloem.

2. What are the two categories of vascular plants ?
   - Vascular plants can be divided into two categories: Plants that produce seeds and plants that do not produce seeds. Examples of classes of plants that do not produce seeds include mosses, ferns, bacteria, molds, algae, and mushrooms. The plants that do produce seeds include the Gymnosperms and Angiosperms. These two classes of plants are very important to people for food, shelter and aèsthetic purposes.

3. What is a Gymnosperm ?
   - Gymnosperms are seed plants that do not produce flowers. The seeds are not found inside fruit or other covering. The seeds from Gymnosperms are usually referred to as naked seeds because they are not found in fruit. Most Gymnosperms' seeds are borne on cones on plants called conifers. They often have needle-like leaves. Examples of conifers are pine, fir, and spruce trees. An example of a Gymnosperm that is not a conifer is the Ginkgo tree.

4. What is an angiosperm ?

   - Most agricultural crops are angiosperms. This is the most abundant class of plants on earth today. Angiosperms are plants whose seeds are produced inside fruits. Angiosperms are flowering plants. Angiosperms are divided into two categories, according to their number of seed leaves. The two categories of Angiosperms are Dicots and Monocots.

5. What are some characteristics of dicots ?

   - Dicots have 2 cotyledons (seed leaves). Their vascular bundles form a ring inside the stem and their flower parts are found in 4's or 5's or multiples of 4's and 5's. Most dicots have broad leaves and netted leaf venation. Tomatoes, marigolds, oak trees and apple trees are examples of dicot plants.

6. What are some characteristics of monocots ?

- Monocots have 1 cotyledon (seed leaf). Their vascular bundles are scattered throughout the stem and their flower parts are found in 3's or multiples of 3's. Most monocots have parallel leaf venation. Corn, Kentucky bluegrass and fescue are examples of monocots.

7. What is a family within the plant kingdom ?

- Classes such as gymnosperms and angiosperms can be further divided into families. A family is composed of groups of plants with similar characteristics. Two examples of families in the angiosperm class of plants are the Legume family and the Grass family.

8. What are some characteristics of the legume plant family ?
The Legume family is a large family of dicots. Most legumes have pinnately compound leaves and root nodules containing nitrogen-fixing bacteria. They are capable of using the nitrogen in the air. The fruit of a legume plant is usually a pod. Plants that are part of the legume family include soybeans, peas, peanuts, clover, alfalfa, and the redbud tree.

9. What are some characteristics of the grass plant family ?
The Grass family is a large family of monocots. Grasses generally have long narrow parallel-veined leaves arranged on a hollow stem. All the cereal plants belong to the grass family. Members of the grass family include corn, wheat, oats, barley, sugar cane, rice, sorghum, Kentucky bluegrass, foxtail, and pampas grass.

10. What is a further division of the plant families ?
Families of plants can be further divided into Genus and species. The Genus and species name of a plant make up the plant's scientific name. The scientific name of a plant is written in Latin. An example of a scientific name is <u>Cercis canadensis</u> or Redbud tree. Scientific names are important to nurseries, growers, scientists, and other people who work with plants. A plant may have many different common names, but only one scientific name. When you use the scientific name of a plant, there is no doubt about what plant you are talking about.

11. How are plants classified by **PLANT PARTS ?**

Plants are often classified by their parts. Plants can be classified according to their type of leaves, stems, flowers, seeds, or roots.

12. **How are plants are classified by their leaves ?**
Plants that have leaves that live for only one growing season and then fall off are know as deciduous plants. Plants that keep their leaves for more than one growing season and have living leaves all year long are know as evergreen.

13. How are plants classified by leaf Veins ?
Leaf venation is the arrangement of veins on a leaf. There are two main types of leaf venation, parallel leaf venation and netted leaf venation. Parallel leaf venation occurs when the veins on a leaf run side by side from the base of the leaf to the tip of the leaf. Netted leaf venation occurs when the veins are arranged similar to the threads of a net.

14. What are the 2 types of leaf venation ?
There are 2 types of netted leaf venation, palmate and pinnate. Palmately arranged veins have several prominent veins branching out from a common point on the base of a leaf to the tip of the lobes. Pinnately arranged veins have one major vein extending from the base to the tip of the leaf with many smaller veins extending across the leaf from the main vein.

15. What are the two main leaf types ?
There are two main leaf types, narrow-leaf plants and broad-leaf plants. Narrow-leaf plants have needle-like leaves. A pine tree is a common example of a narrow-leaved tree. Broad-leaf plants have a wide leaf blade. Oak or maple trees are common examples of broad-leaved trees.

16. What are the types of leaf arrangement ?
Plants are also identified by the way leaves are arranged on the stems of plants. There are three common leaf arrangements on plants: opposite, alternate, and whorled. Plants that have opposite leaf arrangement have leaves that are straight across from each other on the stem. Alternately arranged leaves are not opposite of each other on the stem. In whorled leaf arrangement, three or more leaves are growing from the same point on the stem.

17. **How are plants are classified by their stem ?**
All plants can be classified as either woody or herbaceous. Woody stems are hard, tough stems. These stems can grow fairly large in diameter and are generally covered with a corky bark. Oak trees, maple trees, forsythia, and yews are examples of woody plants. Herbaceous stems are softer and more succulent. These stems are usually green, do not grow very large in diameter, and are not covered by bark. Examples of herbaceous plants are tomatoes, bluegrass and

chives.

18. How are plant buds used to classify plants ?

Buds on a plant stem are often used to identify plants, especially in the winter. The way buds are arranged on a stem, the shape of the bud, and size of the bud are all helpful in plant identification.

19. How are plants are classified by their roots ?

The two basic types of root systems are the Fibrous Root System and the Taproot System. Plants that have a fibrous root system have many main roots that are about the same size. These plants also have many smaller roots. Plants that have a taproot have one primary root with several smaller roots.

20. How are plants are classified by their flowers ?

Flowers can be helpful in identifying plants. The size, shape, color and the time of the year the plant blooms are all useful in plant identification. Also important in identification are the way the flowers are arranged on a plant and the presence or absence of the 4 basic flower parts: sepals, petals, stamens, and pistil.

21. How are plants are classified by their life cycle ?

Plants can be classified by life cycle: Annuals, Biennials, and Perennials.

22. What are annuals ?

Annuals complete their life cycle in one growing season. They are propagated, grow into a plant, and produce seed in the same growing season. Annuals are usually herbaceous. Examples of annual plants include petunias, tomatoes, corn and radishes.

23. What are beinnials ?

Biennials complete their life cycle in 2 growing seasons. These plants grow during one season and produce seeds during the next season. Biennials are usually herbaceous. Foxglove and money plant are two examples of biennial plants.

24. What are perennials ?

Perennials live more than two years. They may be woody or

herbaceous. Fescue, asparagus, rhubarb, chrysanthemums, apple trees, pine trees and juniper are examples of perennials.

25. How are plants are classified by their hardiness ?

The terms tender and hardy refer to a plant's ability to withstand cold temperatures. Tender plants are injured or killed by frost or freezing temperatures. Peppers, watermelon, and coleus are examples of tender plants. Hardy plants are able to survive freezing temperatures and hard frosts. Kentucky bluegrass, cabbage, chrysanthemums, oak trees and apple trees are all examples of hardy plants.

GLOSSARY OF SCIENTIFIC TERMS:

Angiosperm - class of flowering plants whose seeds are borne inside fruit.

Annual - plant that completes its life cycle in one growing season.

Biennial - plant that completes its life cycle in two growing seasons.

Broad-Leaved Plants - plants with wide leaves (NOT needle-like leaves).

Chlorophyll - green material in plants used in making food.

Cotyledon - the first leaf or leaves of the embryo or seed leaves.

Deciduous - plants that have leaves that live for only one growing season.

Dicots - a division of angiosperms that have two seed leaves.

Evergreen - plants that keep their leaves for more than one growing season and have living leaves all year long.

Family - a subdivision of class of plants that contains a group of plants that have similar characteristics.

Fibrous Root System - root system that have many main roots.

Gymnosperms - class of plants that bear naked seeds.

Hardy Plants - plants that are able to survive freezing temperatures and hard frosts.

Herbaceous - plants with soft, succulent stems.

Leaf Venation - the arrangement of veins on a leaf.

Monocots - division of angiosperms that have one seed leaf.

Netted Leaf Venation - leaves whose veins are arranged similar similar to the threads of a net.

Palmate Leaf Venation - type of netted leaf venation whose leaves have several prominent veins branching out from a common point on the base of a leaf to the tip of the lobes.

Parallel Leaf Venation - leaves whose veins run side by side from base of leaf to tip of leaf.

Perennials - plants that live more than two years.

Phloem - the conductive tissue in a plant that carries sugars and minerals from the leaves to the parts of a plant.

Pinnate Leaf Venation - type of netted leaf venation whose leaves have one major vein extending from the base to the tip of the leaf and smaller veins extending from the main vein to the edges of the leaves.

Scientific Name - Genus and species name.

Tap Root - root system with one primary root.

Tender Plants - plants that are injured or killed by frost.

Vascular Bundles - a group of conductive tissues (xylem & phloem) in plants.

Xylem - conductive tissue in plants that carries water from the roots to other plant parts.

WORK SHEET A

Directions: Complete the following questions.

A. Fill-in-the-blank:

1. The plant Kingdom includes organisms that contain _____.

2. _____ and _____ are two classes of plants that are very important to people for food, shelter, and aesthetic purposes.

3. _____ are seed plants that do not produce flowers and produce naked seeds.

4. _____ are flowering plants whose seeds are produced inside fruits.

5. _____ have 2 cotyledons, flower parts found in multiples of 4's or 5's, and vascular bundles that form a ring inside their stem.

6. _____ have 1 cotyledon, flower parts found in multiples of 3's, and vascular bundles scattered throughout the stem.

7. Classes of plants such as angiosperms can further be divided into _____.

8. A plant's scientific name includes the _____ and _____ name and is written in Latin.

WORK SHEET B

Directions:

The answers to the following fill-in-the-blank questions are terms which have something to do with Plant Identification. Choose the terms from the word list below that best answers each question.

Word List:

Angiosperm
Annual
Biennial
Broad-Leaved Plants
Chlorophyll
Cotyledons
Deciduous
Dicots
Evergreen
Fibrous Root
Gymnosperms
Hardy Plants
Herbaceous
Leaf Venation
Monocots
Netted Leaf Venation
Palmate Leaf Venation
Parallel Leaf Venation
Perennials
Phloem
Pinnate Leaf Venation
Scientific Name
Tap Root
Tender Plants
Vascular Bundles
Xylem

Fill-in-the-blank:

1. A class of flowering plants whose seeds are borne inside fruit is the _____ class.

2. _____ are a class of plants that bear naked seeds.

3. The green material in plants used in making food is _____.

4. The first leaf or leaves of the plant embryo are called seed leaves or _____.

5. Angiosperms that have two cotyledons are called _____.

6. Angiosperms that have one cotyledon are called _____.

7. Plants can be classified by their life cycle. An _____ completes its life cycle in one growing season, a _____ completes its life cycle in two growing season, and _____ live more than two years.

8. _____ have wide leaves, not needle-like

leaves.

9. _____ plants have soft, succulent stems.

10. Plants that are able to survive freezing temperatures are known as _____, while plants that are injured or killed by frost are known as _____.

11. _____ is the conductive tissue in plants that carries water from the roots to other plant parts.

12. _____ is the conductive tissue in a plant that carries sugars and minerals from the leaves to other parts of a plant.

13. When the conductive tissues, xylem and phloem are grouped together they are known as _____.

14. The arrangement of veins on a leaf is known as _____ _____.

15. Plants that lose their leaves after one growing season are known as _____, while _____ plants keep their leaves for more than one growing season.

16. A _____ system is a root system that has one primary root, while a _____ system is a root system that has many roots.

17. The plant's Genús and species name make up a plant's _____.

18. _____ occurs when the veins on a leaf run side by side from the base of the leaf to the tip of the leaf.

19. _____ occurs when the veins on a leaf are arranged similar to the threads of a net.

20. One type of netted leaf venation whose leaves have several prominent veins branching out from a common point on the base of a leaf to the tip of the leaf is _____ _____.

21. _____ is a type of netted leaf venation whose leaves have one major vein extending from the base to the tip of the leaf and smaller veins extending from the main vein to the edges of the leaves.

WORK SHEET C

Fill-in-the-blank:

1. _____ is the arrangement of veins on a leaf.

2. When veins on a leaf are arranged side by side from the base of the leaf to the tip of the leaf, the type of leaf venation is _____.

3. Plants that have _____ leaf venation have veins on the leaf arranged similar to the threads of a net.

4. _____ plants have leaves with a blade like the leaves on a maple or oak tree.

5. _____ plants have needle-like leaves like the leaves on a pine or spruce tree.

6. _____ plants lose their leaves after one growing season while _____ plants have living leaves all year long.

7. The three common leaf arrangements on plants are: _____, _____, and whorled.

8. Plants that have hard, tough stems are said to have _____ stems.

9. Plant stems that are soft and succulent are called _____ stems.

10. Plants that have a _____ system have one primary root with several smaller roots.

11. Plants that complete their life cycle in one growing season are called _____.

12. Biennial plants complete their life cycle in _____ growing seasons.

13. _____ plants live for more than two years.

14. _____ plants are injured or killed by frost or freezing temperatures while _____ plants are able to survive freezing temperatures.

WORK SHEET D:
STUDENT REVIEW

1. What is the major difference between Angiosperms and Gymnosperms?

2. List 3 distinguishing characteristics of dicots.

3. List 3 distinguishing characteristics of monocots.

4. Why are scientific names important to people who work with plants?

5. What is the difference between evergreen and deciduous plants?

6. What are the two main types of leaf venation.

7. What is the difference between narrow-leaf plants and broad-leaf plants?

8. Name the 3 common leaf arrangements on plants.

9. List the characteristics of woody and herbaceous plants.

10. What are the two basic types of root systems? How are they different?

11. How can flowers be used in identifying plants?

12. How long of a life cycle does an annual have?

13. How long of a life cycle does a biennial have?

14. When does a perennial complete its life cycle?

15. What plants will not survive frost or freezing temperatures?

16. Which plants can survive freezing temperatures?

WORK SHEET A

Directions: Complete the following questions.

A. Fill-in-the-blank:

1. The plant Kingdom includes organisms that contain _*chlorophyll*_.

2. _*Gymnosperms*_ and _*Angiosperms*_ are two classes of plants that are very important to people for food, shelter, and aesthetic purposes.

3. _*Gymnosperms*_ are seed plants that do not produce flowers and produce naked seeds.

4. _*Angiosperms*_ are flowering plants whose seeds are produced inside fruits.

5. _*Dicots*_ have 2 cotyledons, flower parts found in multiples of 4's or 5's, and vascular bundles that form a ring inside their stem.

6. _*Monocots*_ have 1 cotyledon, flower parts found in multiples of 3's, and vascular bundles scattered throughout the stem.

7. Classes of plants such as angiosperms can further be divided into _*families*_.

8. A plant's scientific name includes the _*Genus*_ and _*species*_ name and is written in Latin.

WORK SHEET B

Directions:

The answers to the following fill-in-the-blank questions are terms which have something to do with Plant Identification. Choose the terms from the word list below that best answers each question.

Word List:

Angiosperm
Annual
Biennial
Broad-Leaved Plants
Chlorophyll
Cotyledons
Deciduous
Dicots
Evergreen
Fibrous Root
Gymnosperms
Hardy Plants
Herbaceous
Leaf Venation
Monocots
Netted Leaf Venation
Palmate Leaf Venation
Parallel Leaf Venation
Perennials
Phloem
Pinnate Leaf Venation
Scientific Name
Tap Root
Tender Plants
Vascular Bundles
Xylem

Fill-in-the-blank:

1. A class of flowering plants whose seeds are borne inside fruit is the _*Angiosperm*_ class.

2. _*Gymnosperms*_ are a class of plants that bear naked seeds.

3. The green material in plants used in making food is _*chlorophyll*_.

4. The first leaf or leaves of the plant embryo are called seed leaves or _*cotyledons*_.

5. Angiosperms that have two cotyledons are called _*dicots*_.

6. Angiosperms that have one cotyledon are called _*monocots*_.

7. Plants can be classified by their life cycle. An _*annual*_ completes its life cycle in one growing season, a _*biennial*_ completes its life cycle in two growing season, and _*perennials*_ live more than two years.

8. *Broad-leaved plants* have wide leaves, not needle-like leaves.

9. *Herbaceous* plants have soft, succulent stems.

10. Plants that are able to survive freezing temperatures are known as *hardy plants*, while plants that are injured or killed by frost are known as *tender plants*.

11. *Xylem* is the conductive tissue in plants that carries water from the roots to other plant parts.

12. *Phloem* is the conductive tissue in a plant that carries sugars and minerals from the leaves to other parts of a plant.

13. When the conductive tissues, xylem and phloem are grouped together they are known as *vascular bundles*.

14. The arrangement of veins on a leaf is known as *leaf venation*.

15. Plants that lose their leaves after one growing season are known as *deciduous*, while *evergreen* plants keep their leaves for more than one growing season.

16. A *tap root* system is a root system that has one primary root, while a *fibrous root* system is a root system that has many roots.

17. The plant's Genus and species name make up a plant's *scientific name*.

18. *Parallel Leaf Venation* occurs when the veins on a leaf run side by side from the base of the leaf to the tip of the leaf.

19. *Netted Leaf Venation* occurs when the veins on a leaf are arranged similar to the threads of a net.

20. One type of netted leaf venation whose leaves have several prominent veins branching out from a common point on the base of a leaf to the tip of the leaf is *palmate leaf venation*.

21. *Pinnate Leaf Venation* is a type of netted leaf venation whose leaves have one major vein extending from the base to the tip of the leaf and smaller veins extending from the main vein to the edges of the leaves.

WORK SHEET C

Fill-in-the-blank:

1. *Leaf venation* is the arrangement of veins on a leaf.

2. When veins on a leaf are arranged side by side from the base of the leaf to the tip of the leaf, the type of leaf venation is *parallel*.

3. Plants that have *netted* leaf venation have veins on the leaf arranged similar to the threads of a net.

4. *Broad-leaf* plants have leaves with a blade like the leaves on a maple or oak tree.

5. *Narrow-leaf* plants have needle-like leaves like the leaves on a pine or spruce tree.

6. *Deciduous* plants lose their leaves after one growing season while *evergreen* plants have living leaves all year long.

7. The three common leaf arrangements on plants are: *opposite*, *alternate*, and whorled.

8. Plants that have hard, tough stems are said to have *woody* stems.

9. Plant stems that are soft and succulent are called *herbaceous* stems.

10. Plants that have a *taproot* system have one primary root with several smaller roots.

11. Plants that complete their life cycle in one growing season are called *annuals*.

12. Biennial plants complete their life cycle in *two* growing seasons.

13. *Perennial* plants live for more than two years.

14. *Tender* plants are injured or killed by frost or freezing temperatures while *hardy* plants are able to survive freezing temperatures.

STUDENT ACTIVITY - 1

Identification of 10 Plants

a. **Purpose:** to understand some of the ways plants can be identified or classified.

b. **What Each Student Needs:** ten plants or ten plant ID cards.

c. **Here's How:**

1. Obtain a plant or plant ID card from instructor.

2. Record plant name next to its number on the activity record sheet.

3. Examine plant.

4. Examine the leaves.

5. Determine the leaf venation and leaf type. Circle the leaf venation and leaf type on activity record sheet.

6. Determine if the plant is a gymnosperm, angiosperm - monocot, angiosperm - dicot. Use its leaf venation and leaf type as clues. Circle its plant class on activity record sheet.

7. Examine the plant's stem. Determine if it's woody or herbaceous and circle the corresponding type of stem on activity record sheet.

8. Determine plant's life cycle and hardiness. Use your experiences with the plant or a reference to help you reach a conclusion. Circle correct life cycle and plant hardiness on activity record sheet.

9. Repeat this process with the other 9 plants.

ACTIVITY RECORD SHEET

	LEAF VENATION	LEAF TYPE	PLANT CLASS	TYPE OF STEM	LIFE CYCLE	PLANT HARDINESS
Plant 1 Plant Name: _____	Parallel Netted-pinnate Netted-palmate	Broad-leaved Narrow-leaved	Gymnosperm Angiosperm Monocot Angiosperm- Dicot	Woody Herbaceous	Annual Biennial Perennial	Tender Hardy
Plant 2 Plant Name: _____	Parallel Netted-pinnate Netted-palmate	Broad-leaved Narrow-leaved	Gymnosperm Angiosperm- Monocot Angiosperm- Dicot	Woody Herbaceous	Annual Biennial	Tender Hardy
Plant 3 Plant Name: _____	Parallel Netted-pinnate Netted palmate	Broad-leaved Narrow-leaved	Gymnosperm Angiosperm- Monocot Angiosperm- Dicot	Woody Herbaceous	Annual Biennial Perennial	Tender Hardy
Plant 4 Plant Name: _____	Parallel Netted-pinnate Netted-palmate	Broad-leaved Narrow-leaved	Gymosperm Angiosperm- Monocot Angiosperm- Dicot	Woody Herbaceous	Annual Biennial Perennial	Tender Hardy
Plant 5 Plant Name: _____	Parallel Netted-pinnate Netted-palmate	Broad-leaved Narrow-leaved Broad-leaved	Gymnosperm Angiosperm Monocot Angiosperm- Dicot	Woody Herbaceous	Annual Biennial Perennial	Tender Hardy

ACTIVITY RECORD SHEET

	LEAF VENATION	LEAF TYPE	PLANT CLASS	TYPE OF STEM	LIFE CYCLE	PLANT HARDINESS
Plant 6 Plant Name: _____	Parallel Netted-pinnate Netted-palmate	Broad-leaved Narrow-leaved	Gymnosperm Angiosperm Monocot Angiosperm- Dicot	Woody Herbaceous	Annual Biennial Perennial	Tender Hardy
Plant 7 Plant Name: _____	Parallel Netted-pinnate Netted-palmate	Broad-leaved Narrow-leaved	Gymnosperm Angiosperm- Monocot Angiosperm- Dicot	Woody Herbaceous	Annual Biennial	Tender Hardy
Plant 8 Plant Name: _____	Parallel Netted-pinnate Netted palmate	Broad-leaved Narrow-leaved	Gymnosperm Angiosperm- Monocot Angiosperm- Dicot	Woody Herbaceous	Annual Biennial Perennial	Tender Hardy
Plant 9 Plant Name: _____	Parallel Netted-pinnate Netted-palmate	Broad-leaved Narrow-leaved	Gymosperm Angiosperm- Monocot Angiosperm- Dicot	Woody Herbaceous	Annual Biennial Perennial	Tender Hardy
Plant 10 Plant Name: _____	Parallel Netted-pinnate Netted-palmate	Broad-leaved Narrow-leaved Broad-leaved	Gymnosperm Angiosperm Monocot Angiosperm- Dicot	Woody Herbaceous	Annual Biennial Perennial	Tender Hardy

WORK SHEET D:
STUDENT REVIEW

1. What is the major difference between Angiosperms and Gymnosperms?

   Angiosperms are flowering plants whose seeds are produced in fruit. Gymnosperms are seed plants which produce seeds that are not found in fruit. These seeds are called naked seeds. Gymnosperms do not produce flowers.

2. List 3 distinguishing characteristics of dicots.

   Dicots have 2 cotyledons. Their vascular bundles form a ring inside the stem and their flower parts are found in 4's or 5's. Also most dicots have broad leaves and netted leaf venation.

3. List 3 distinguishing characteristics of monocots.

   Monocots have one cotyledon. Their vascular bundles are scattered throughout the stem and their flower parts are found in 3's. Also most monocots have parallel leaf venation.

4. Why are scientific names important to people who work with plants?

   Plants have many different common names, but only one scientific name.

5. What is the difference between evergreen and deciduous plants?

   Plants that have leaves that live for only one growing season and then fall off are known as deciduous plants. Plants that keep their leaves for more than one growing season and have living leaves all year long are known as evergreen plants.

6. What are the two main types of leaf venation.

   The two main types of leaf venation are parallel leaf venation and netted leaf venation.

7. What is the difference between narrow-leaf plants and broad-leaf plants?

   Narrow-leaf plants have needle-like leaves while broad-leaf plants have plants with wide leaf blades.

8. Name the 3 common leaf arrangements on plants.

The three common leaf arrangements are opposite, alternate, and whorled.

9. List the characteristics of woody and herbaceous plants.

Woody plants have hard, tough stems that can grow fairly large in diameter and are generally covered with a corky bark. Herbaceous plants have stems that are softer and more succulent. Stems on herbaceous plants are usually green. These stems do not grow very large in diameter and are not covered with bark.

10. What are the two basic types of root systems? How are they different?

The two basic types of root systems are the fibrous root system and the taproot system. Plants that have a fibrous root system have many main roots that are about the same size and many smaller roots. Plants that have a taproot system have one primary root with several smaller roots.

11. How can flowers be used in identifying plants?

The size, shape, color and the time of the year the plant blooms are all useful in plant identification. The way the flowers are arranged on a plant and the absence of any of the 4 basic flower parts: sepals, petals, stamens, and pistil are also useful in plant identification.

12. How long of a life cycle does an annual have?

An annual completes its life cycle in one growing season.

13. How long of a life cycle does a biennial have?

A biennial completes its life cycle in 2 growing seasons.

14. When does a perennial complete its life cycle?

A perennial lives for more than 2 years.

15. What plants will not survive frost or freezing temperatures?

Tender plants are injured by frost or freezing temperatures.

16. Which plants can survive freezing temperatures?

Hardy plants can survive freezing temperatures.

Quiz 1

A. Matching

Match the best definition with each term:

_____	1.	Deciduous	a.	plants that are injured or killed by frost
_____	2.	Evergreen	b.	plants that complete their life cycle in one growing season
_____	3.	Annuals	c.	plants that have leaves that live for only one growing season
_____	4.	Perennials	d.	plants that are able to survive freezing temperatures and hard frosts.
_____	5.	Tender Plants	e.	plants that keep their leaves for more than one growing season and have living leaves all year long
_____	6.	Hardy plants	f.	plants that live more than two years.

B. Short Answer

7. Why do people who work with plants use scientific names?

8. List two characteristics of dicot plants.

9. List two characteristics of monocot plants.

C. True-False

_____10. The seeds of angiosperms are not found inside fruit.

_____11. Woody plants have hard, tough stems that are generally covered with bark.

_____12. The presence or absence of the 4 basic flower parts (sepals, petals, stamens, and pistil) can be used in identifying a plant.

D. Fill-in-the-Blank

13. The two basic types of root systems on plants are the _____ and _____ root systems.

14. The three common leaf arrangements on plants are: whorled, _____ and _____.

15. The arrangement of veins on a leaf is known as _____ _____.

Quiz 1

A. Matching

Match the best definition with each term:

c	1.	Deciduous	a.	plants that are injured or killed by frost
e	2.	Evergreen	b.	plants that complete their life cycle in one growing season
b	3.	Annuals	c.	plants that have leaves that live for only one growing season
f	4.	Perennials	d.	plants that are able to survive freezing temperatures and hard frosts.
a	5.	Tender Plants	e.	plants that keep their leaves for more than one growing season and have living leaves all year long
d	6.	Hardy plants	f.	plants that live more than two years.

B. Short Answer

7. Why do people who work with plants use scientific names?
Plants can have many different common names, but they only have one scientific name.

8. List two characteristics of dicot plants.
(Students should list 2 of the following:) Dicots have 2 cotyledons. Their vascular bundles form a ring inside the stem. Their flower parts are found in 4's or 5's. Most have broad leaves and netted leaf venation.

9. List two characteristics of monocot plants.
(Students should list 2 of the following:) Monocots have 1 cotyledon. Their vascular bundles are scattered throughout the stem and their flower parts are found in 3's. Most have parallel leaf venation.

C. True-False

False 10. The seeds of angiosperms are not found inside fruit.

True 11. Woody plants have hard, tough stems that are generally covered with bark.

False 12. The presence or absence of the 4 basic flower parts (sepals, petals, stamens, and pistil) can be used in identifying a plant.

D. Fill-in-the-Blank

13. The two basic types of root systems on plants are the *tap* and *fibrous* root systems.

14. The three common leaf arrangements on plants are: whorled, *opposite* and *alternate*.

15. The arrangement of veins on a leaf is known as *leaf venation*.

OH1

PLANT KINGDOM

1. Plants with Vascular Systems

   a. All vascular plants have true roots, stems, and leaves.

   b. Vascular plants have tissues of tubelike cells that carry water throughout the plant.

2. Plants without Vascular Systems

VASCULAR PLANTS

1. Plants that do not produce seeds

   a. Example: Mosses, ferns, bacteria, molds, algae, and mushrooms.

2. Plants that do produce seeds

   a. Gymnosperms and Angiosperms

   b. Important to people for food and shelter.

OH3

GYMNOSPERMS:

a. Are seed plants that do not produce flowers.

b. Bear naked seeds that are not found inside fruit.

c. Seeds are usually borne on cones.

d. Examples: Pine, fir and spruce trees.

ANGIOSPERMS:

a. Are flowering plants.

b. Bear seeds that are found inside fruits.

c. Include most agricultural crops.

d. Divided into 2 categories according to the number of seed leaves on the plant.

    1. Monocot - one cotyledon

    2. Dicot - two cotyledons

OH5

KINGDOM - PLANT

Class - Angiosperm

Subclass - Dicot

Family - Legume

Genus - Cercis

species - canadensis

OH6

TYPES OF STEMS

A. Woody Stems
   1. Hard, tough stems
   2. Can grow large in diameter
   3. Usually covered with bark

B. Herbaceous Stems
   1. Soft, succulent stems
   2. Usually green in color
   3. Do not grow very large in diameter
   4. Are not covered with bark